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ABSTRACT

This study compared the influence of two play environments on young children's make-believe object transformation behaviors. One environment contained traditional realistic play props; the other contained nonrealistic objects. Subjects were 32 Caucasian children, 17 boys and 15 girls, between 40 and 73 months of age, from working- or middle-class families. Subjects were randomly assigned to same-age, same-sex triads. Each individual was observed while playing in these groups during two 20-minute sessions, one in each environment. All symbolic transformations of objects during play sessions were tallied for each subject. Three types of transformations were coded: simple pretenses, traditionally defined transformations, and symbolic actions in which gestures or body parts were used to stand for make-believe objects. The traditional environment provided male and female sex-typed props, such as tools, trucks, cooking sets, and dolls. The nonrealistic environment included large and small boxes, cement blocks, boards, sticks, and other objects. Findings revealed that in children under 5, realistic materials elicited the greatest number of transformations, as was predicted. It is maintained that the abandoning of such props in favor of nonrealistic materials may deprive children of fundamental opportunities to practice symbolizing. (RH)

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The Effects of Realistic Versus Nonrealistic Play Materials On Young Children's Symbolic Transformation of Objects

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The symbolic play of young children has been analyzed as the mental transformation of real objects, persons, or events into make believe ones (Fein, 1975). This pretend aspect of play has been viewed as both an indicator of the emergence of representational thinking (Piaget, 1962) and a mediator in the development of the use of symbols in early childhood (Vgotsky, 1967).

Young children have been observed performing several types of transformational behaviors (McLoyd, 1985). They substitute make believe events for real life situations (Bretherton, 1984; Smilansky, 1968) and transform themselves into make believe characters (Lowe, 1975; McLoyd, 1983; Watson & Jackowitz, 1984).

Pretend play with objects has received special attention in the literature due to its prevalence and early appearance within childhood activity (Fein, 1975; Field, Stefano & Koewler, 1982; Johnson, Christie, & Yawkey, 1987; McGee, Ethridge, & Benz, 1984; Ungerer, Zelazo, Kearsley, & O'Learly, 1981).

The purpose of this study was to compare the influence of two distinct play environments, one equipped with traditional realistic play props and the other with nonrealistic objects, on the performance of these make believe object transformations within the spontaneous symbolic play of young children.

Vgotsky (1967) has argued that the make believe substitution of one object for another contributes to the development of representational thought in early childhood. When available objects are used as "signifiers" to stand for things which are not actually present, the child is taking an

important midstep from early thought, which is tied exclusively to the immediate environment, toward pure symbolic representation, which is fully liberated from the concrete world in adulthood.

To Vgotsky this substitutional activity can be viewed as essential practice at symbolizing, a developmentally useful exercise leading to intellectual advancement. A logical implication of his work is that home and school environments should be structured to encourage young children to transform the real into the nonreal. A question to be raised in this study is: What types of play objects provide the greatest opportunities for this practice at symbolization?

McLoyd (1983) has reported that preschool children adapt their symbolic play activities according to the "structure," or relative realism, of available objects. Of special relevance to the present study was her finding that "unstructured" materials (ie., boxes and pipe-cleaners), in contrast to more realistic play props, elicited the greatest numbers of object substitutions.

Children of her study used the realistic materials in mainly conventional ways (eg., a toy stove was usually used to represent a real stove). Non realistic objects, in contrast, were more likely to be fully transformed into imaginary ones. Only these latter transformational behaviors were considered instances of genuine symbolization.

Other researchers have demonstrated that symbolic activity

is not just a function object realism, but also of age (Elder & Pederson, 1978; Fein, 1975; Overton & Jackson, 1973). Children before age three years have been found to have difficulty transforming objects which are highly dissimilar from those absent referents they are asked to represent (eg., using half an egg-shaped plastic container as a cup) and are generally unsuccessful in using gestures or body parts to pretend when no objects were provided (eg., using ones hand with spread fingers to represent a comb).

They are better able to perform make believe tasks when realistic objects are available (eg., feeding a model horse from a toy cup), suggesting that these younger subjects are reliant on the realism of play props in order to symbolize at all. Older preschoolers and school aged children were found to be more successful at these transformational tasks.

One interpretation of previous research findings is that an interaction exists between age and the realism of play objects available in their effects on the spontaneous symbolic activity of young children. While older children are able to transform nonrealistic materials, on the one hand, and are restricted by the realism of prototypical play props, on the other; younger preschool children may require such props in order to pretend at all.

Fein (1982) has translated these conclusions into educational practice:

> These and other studies suggest that symbolic play is influenced by the play materials available to the

> child. In young children, play is enhanced by realistic materials and realistic toy props. With age, the need for realistic materials diminishes and...less realistic toys might even enhance the imaginativeness of play in older children. (p. 62)

These findings raise questions about the adequacy of traditional preschool play props in fostering symbolic activity. Would children above age 3 benefit most from a play area equipped with nonrealistic objects?

In earlier studies transformations have been narrowly defined as make believe actions in which an object is used as if it were something completely different. Such narrow definitions do not appreciate a range of symbolic activities which are performed with realistic objects. Using a miniature replica in its conventional way but within a make believe context (eg., using a toy pan to cook a pretend meal), for example, has not usually been counted as a make believe act.

Performing these types of transformations, called "simple pretenses" by Johnson et al. (1987), does require complex analogous thought. In describing a child feeding a realistic model horse from a toy cup, Fein (1975) explains:

> The child is able to shift roles, attribute living functions to an inanimate object, add liquid to an empty cup, and, importantly, establish the relation between horse and cup. (p.293)

In such activity some aspects of reality must be mentally transformed, even if the objects themselves are not given completely new identities.

In the present study the effects of object realism were

reexamined using a broader measure of transformational activity. All make believe uses of objects were counted as acts of symbolization, even these rarely studied pretenses. It was predicted that an environment equipped with realistic play props would elicit the highest number of overall transformations across the age range represented.

Such an outcome seems plausible when this broader definition of symbolic transformation is adopted. Realistic play props would seem to exclusively suggest make believe games, resulting in object transformation of some type--even if most of this activity were to involve simple pretenses. Nonrealistic objects, in contrast, could be used in numerous nonsymbolic pursuits as well, such as building, throwing, or noise making.

Method

The subjects were 32 Caucasian children, 17 boys and 15 girls, aged 40 to 73 months, whose families were of working or middle class status. Subjects were randomly assigned to same age, same sex triads. Each individual was observed playing in these small groups during two, twenty minute sessions, once within a play environment equipped with realistic play props and once in a setting containing nonrealistic ones.

During these play sessions all symbolic transformations of objects were tallied for each subject. Transformations were defined as acts of using available play objects in make believe ways. Three different types of transformations were considered when coding this dependent variable. Simple pretenses, called

Type I transformations in this investigation, were counted. These could be observed in both the realistic (eg., using a toy cup to drink pretend coffee) and nonrealistic (eg., using a stick as if it were a pirate's walking stick) play environment.

Traditionally defined transformations, called Type II's here, were also tallied. These were recorded in both the realistic (eg., using an inverted toy cup as if it were a microphone) and nonrealistic (eg., using a stick as if it were a broom) setting as well.

A third type of symbolic action, in which gestures or body parts are used to stand for make believe objects, called Type III transformations in this study, were also counted in scoring overall transformations, though these were rarely observed in these play samples.

To asses the reliability of these coding procedures two observers simultaneously scored the behavior of three different subjects as each played for one hour in the realistic setting and for another hour in the nonrealistic one. Interobserver agreement was found to be high. Cohen's kappas for agreement on identification of overall transformations and on coding of Type I's and Type II's ranged from .90 to .92. Performance of Type III's was so low during the reliability coding that they were not further analyzed separately, though they were counted as instances of overall transformations when they were observed.

The realistic play environment, created in a small empty room within the center where the study was conducted, contained

traditional preschool play props. These items were novel and unfamiliar to the subjects, although similar toys were available to them within their classrooms. An equal number of male (ie., tools, trucks) and female (cooking set, dolls) sex-typed props were provided.

The nonrealistic environment, set up in the same room on alternate days, included large and small boxes, cement blocks, boards, sticks, metal and cardboard circles of various sizes, metal rings and unmarked cardboard cylinders. These objects were selected following McLoyd's (1983) criteria: Items resembling a human form or in any other way suggesting a specific use were excluded.

A series of regression analyses were conducted to test the primary hypothesis of the study. The regressions of Overall Transformations on Age, Sex, Realism of Play Objects and interactions among these independent variables were examined. Interactions were analyzed by creating Age x Realism of Play Objects and Age x Realism of Play Objects x Sex interaction vectors and entering these into the regression analyses. The strength of both main and interaction effects were expressed, then, in correlational form.

A full discussion of these procedures and the advantages of regression over the traditional analysis of variance in analyzing data of this variety are provided by Kerlinger and Pedhazur (1973).

Results

The mean frequencies and standard deviations of Overall Transformation for various subgroups and conditions studied are presented in Table 1. Mean performance of the various subcategories of overall transformational behavior--Types I, II, and III--are also presented. The strength of relationships examined are expressed by correlation coefficients in Table 2. A number of significant main effects and interaction effects were discovered.

Insert Tables 1 and 2 about here

Main Effects

The primary purpose of the present study was to determine whether realism of play objects was related to Overall Transformations. As shown in Table 2, significantly more transformations of objects were performed within the realistic environment, as predicted, $r = .26$, $p \leq .05$. Neither age nor sex were related to this dependent measure.

To further understand the nature of the relationship between these independent variables and symbolic activity, Overall Transformations was partitioned into its constituent types for analysis. Regressions of Type I and Type II transformations (Type III's were too infrequently observed to be analyzed) on each independent measure were also examined as shown in Table 2.

Type I's, those simple pretenses in which objects are used

in conventional but make believe ways, were more often performed in the realistic play setting, $r = .61$, $p \leq .001$, but there performance was not related to age or sex. Type II's, those traditionally defined transformations in which an object is used to represent something completely different, were found to be positively related to age, $r = .34$, $p \leq .01$ and were recorded significantly less often within the realistic environment, $r = -.64$, $p \leq .001$.

Age x Realism of Play Objects

Significant Age x Realism of Play Objects interaction effects were found on Overall Transformations, $r = .24$, $p \leq .05$. When transformations were partitioned by type, interaction effects were discovered on Type I, $r = .57$, $p \leq .001$, and Type II's, $r = -.61$, $p \leq .001$.

These significant interactions were examined graphically following procedures outlined by Kerlinger and Pedhazur (1973). Separate transformation on age regression lines, one set for the realistic and another for the nonrealistic play environment, were plotted. The results of these analyses are presented in figures 1, 2 and 3.

Insert Figures 1, 2 and 3 about here

Figure 1 shows results regarding Type I transformations. Within the realistic environment there was a slight decline in the performance of these simple pretenses as children became

older. A small increase with age was noted for this variable within the nonrealistic setting. Performance of Type I's remained higher than other types within the realistic environment, even for the very oldest subjects.

Figure 2 illustrates findings on Type II transformations. Within the realistic setting the frequency of these substitutional behaviors was very low across all ages. In the nonrealistic environment, Type II's increased sharply in frequency with age.

Figure 3 illustrates interaction effects on Overall Transformations, yielding a cumulative picture of the relationships among Age, Object Realism and total transformational activity. Within the realistic environment, frequency of Overall Transformations remains higher than that within the nonrealistic setting across much of the age range of interest in the study.

There is a marked increase in the performance of Overall Transformations within the nonrealistic play area, although these frequencies do not surpass those observed in the realistic environment until after age five. Figure 3, then, graphically affirms the hypothesis of the study. Until age five, the realistic materials elicited the greatest numbers of Overall Transformations, as predicted.

Age x Realism of Play Objects x Sex

Age x Realism of Play Objects x Sex interaction effects

were discovered on Overall Transformations, $r = .31$, $p \leq .05$, as shown in Table 2. The source of this interaction was the particularly strong correlations between age and transformations for girls, relative to boys, within the nonrealistic play environment. The relationship between age and transformations within the nonrealistic setting, which is demonstrated by the solid regression line in Figure 3, is explained by the strong significant correlation between these variables for female subjects only, $r = .78$, $p \leq .001$. For males the slope of this regression line was found to be far less steep and nonsignificant.

This finding further supports the prediction of this study that realistic play props stimulate the greatest amount of object symbolization. Boys did not show an increasing inclination to pretend in the nonrealistic setting as they got older. Even after age five realistic materials were superior in eliciting object pretense among these male subjects.

Discussion

If traditional definitions of object transformations were exclusively utilized in the present study, findings and conclusions here would resemble with minor variation those of previous research efforts. Because Type I Transformations, those involving the make believe use of objects in the conventional ways suggested by their properties, are included for analysis, an entirely different picture of the development of symbolization and the impact of play materials on this

process emerges.

When the main effects of Age on Type II transformations (those traditionally defined object substitutions) were examined, for example, it could be concluded that relatively low levels of symbolic behavior are performed at age three years and that such activity gradually increases as children get older, an interpretation consistent with the conclusions of earlier authors (Elder & Pederson, 1978; Fein, 1975; Overton & Jackson, 1973).

When Type I transformations were included in the computation of Overall Transformations, however, it was found that children of this younger age did engage in much symbolic activity. In fact, these youngest subjects performed slightly more transformations within the realistic setting than their older peers. This frequency of symbolic activity may be explained by the high rate of the less abstract Type I transformations performed by this age group. Although such symbolic acts have not always been viewed as instances of genuine symbolic play (Johnson et al., 1987), they contain elements of the substitutional behavior to which Vgotsky (1967) has attributed such developmental importance. Even very young preschoolers, it may be concluded from these data, engage in a kind of make believe which may contribute to their acquisition of symbols.

That consistently high levels of Type I's were performed across all age groups suggests that children do not outgrow an

interest in pretending with realistic toys as early as was previously assumed. While children of this study did demonstrate with age a growing capacity to transform the real into the totally imaginary, performance of such acts did not displace less abstract Type I Transformations within their play activities. Type I's appear to persist in young children's spontaneous activity and continue to account for a large percentage of overall object symbolization throughout the preschool years.

Entering Type I Transformations into the present analysis has also allowed the discovery of significant Age x Realism of Play Objects x Sex interaction effects which indicate the relative importance of the realistic play prop as a medium of symbolic expression and a potential mediator in the acquisition of representational thinking.

Had traditional definitions been adopted, findings here would have resembled McLoyd's (1983) discovery that unstructured materials lead most often to make believe. The addition of these simple pretenses to the analysis has revealed that pretending with realistic toys comprises a large portion of object symbolization performed by children into the school age years. Even girls, who favor nonrealistic pretend objects after age five, continue to transform realistic toys at a high rate.

The comparatively low frequency of Overall Transformations with nonrealistic materials might be explained, in part, by the work of Hutt (1976), who has reported that novel objects were

more likely to be explored than imaginatively transformed by young children. Perhaps the ambiguous features of nonrealistic materials provoked uncertainty about their properties or functions, leading more often to exploratory manipulation than to make believe transformation.

The lack of structure of these materials allowed many non-symbolic uses such as stacking, pounding, and throwing whereas the realism of play props served to structure and guide the performance of one kind of activity--make believe--resulting in numerous object transformations.

Realistic play materials may be viewed, then, as primary catalysts of symbolic expression. Abandoning such props in favor of nonrealistic materials might deprive children of fundamental opportunities to practice symbolizing.

Age x object realism x sex interactions discovered here also suggest that nonrealistic materials hold promise as stimulants of the more abstract Type II transformations, particularly for older girls. These symbolic acts require greater abstraction since the child has a greater representational distance to travel, in performing these, from the immediate physical object to its dissimilar imagined referent. Their performance might be particularly useful practice, then, at separating meaning from objects (Vgotsky, 1976).

Play centers equipped, or partially equipped, with nonrealistic materials might, then, be incorporated into the

kindergarten classroom or playground. These objects should not displace traditional play props, however, which continue to provide the greatest impetus for make believe. Based on the present research, it may be concluded that kindergarten age girls would benefit most from these raw materials, a proposition which runs counter to stereotyped expectations of children's toy use (Coates, Cord, & Jakobovics, 1975).

In this study female subjects more often used sticks and cardboard boxes to symbolize, whereas their male counterparts continued to pretend most frequently with dolls and toy dishes. Teachers should be cautious, then, not to implicitly limit boys' participation in the dramatic play center, in which their preferred media for object pretense are available. Likewise girls should be encourage to transform nonrealistic materials in their play.

Since younger children were found to perform only very small numbers of transformations within nonrealistic environments, devotion of space and resources to a full center of such materials within a preschool classroom would not be warranted. Still, research indicates that incorporation of a few nonrealistic play objects into the traditional realistic dramatic play center might be useful for three and four year olds.

The present study confirms that very young children would occasionally transform these materials. Fein's (1975) work suggests, in fact, that the realistic play props in such an area

would support the transformation of these nonrealistic ones. Children of this age group might be induced to pretend by the realism of play props, but could then incorporate, through more abstract transformations, one or several nonrealistic materials into their play themes.

A question unanswered in this study is whether the practice of many low level transformations or, for that matter, a few highly abstract ones actually promotes the development of symbolic thought as Vgotsky (1967) suggests. The degree to which each type of symbolization predicts later advancement in the use of symbols, then, requires further empirical study.

In this investigation, the impact of an environment with exclusively nonrealistic materials has been compared to one with only realistic ones. Since it has been shown by Fein (1975) that a mixture of such materials might provide an optimal environment for pretending for younger children, the effects of settings equipped with varying ratios of realistic to nonrealistic objects might be developed and studied. Can an optimal mixture for practicing symbolization be identified for each age level within the preschool years?

Adult intervention strategies have been found to increase the make believe use of objects, within traditional dramatic play centers (Smilansky, 1968). What would be the impact of such adult modelling, guidance, prompting and question-asking techniques on young children's symbolic use of objects within nonrealistic play settings?

In summary, these findings rescue realistic dramatic play props from a low level educative status to which they have sometimes been assigned in the literature. Such materials provoke high levels of pretend play in young children and may be indispensable components of successful play intervention programs.

Table 1. Mean Frequencies and Standard Deviations of Transformations

Group	Overall		Type I		Type II		Type III	
	M	SD	M	SD	M	SD	M	SD
Realistic								
Males	19.24	13.97	15.71	6.55	2.41	1.94	1.12	1.71
Females	26.39	18.15	23.93	17.50	1.53	1.82	.93	1.39
Nonrealistic								
Males	16.95	8.91	3.53	3.89	12.24	6.92	1.18	1.64
Females	14.80	12.21	5.47	5.53	9.13	7.56	.20	.41

Table 2. Correlations Among Types of Transformations and Age, Realism of Play Objects, Sex and Interaction Vectors

Transformation Type	Age (A)	Realism of Play Objects (B)	Sex (C)	AxB	AxBxC
Overall	.17	.26*	.10	.24*	.31*
Type I	.00	.61***	.20	.57***	.52***
Type II	.35**	-.64***	.15	-.61***	-.38**

* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

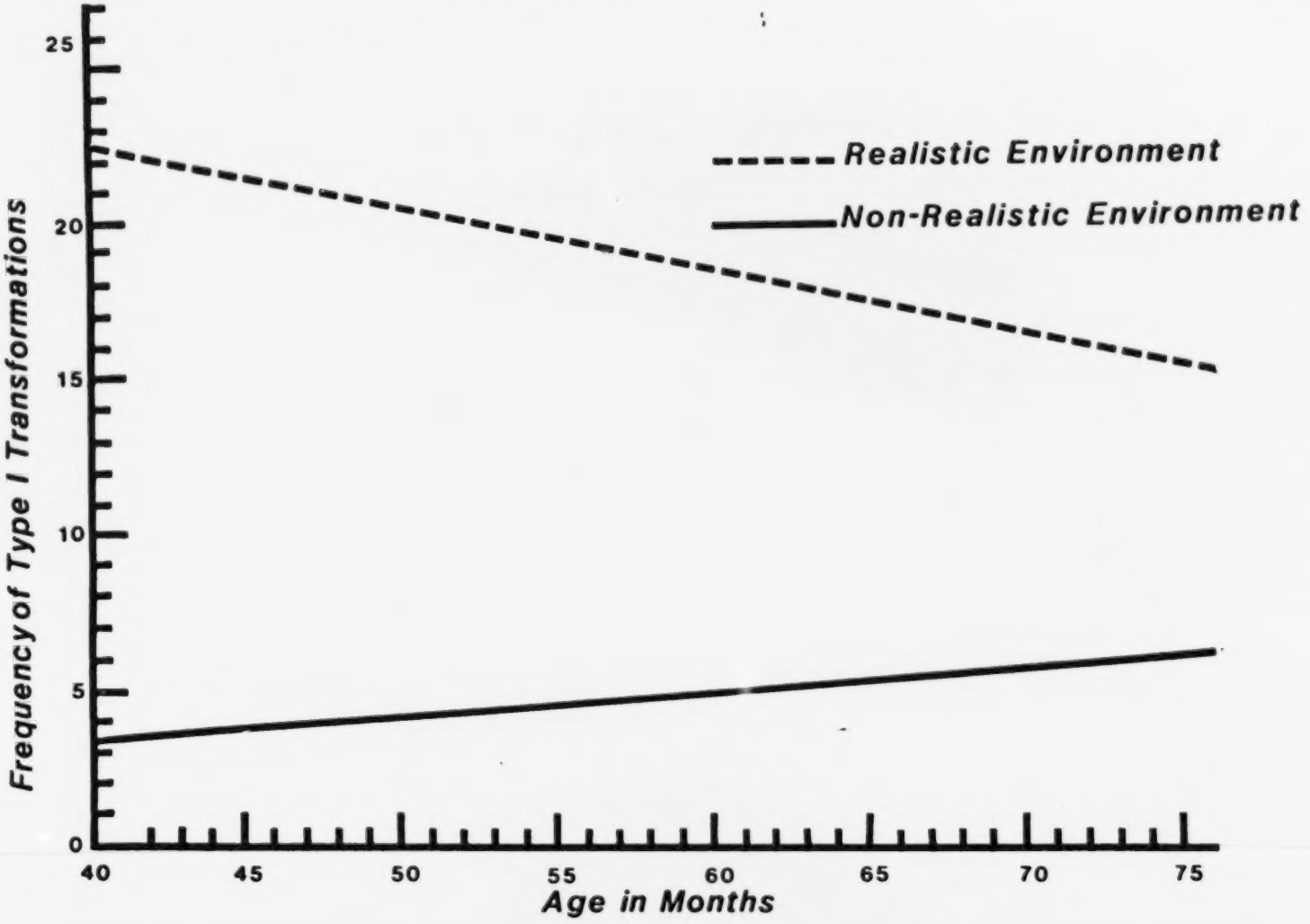

Figure 1. Regression Lines Illustrating Age x Play Environment Interaction Effects on Type I Transformations.

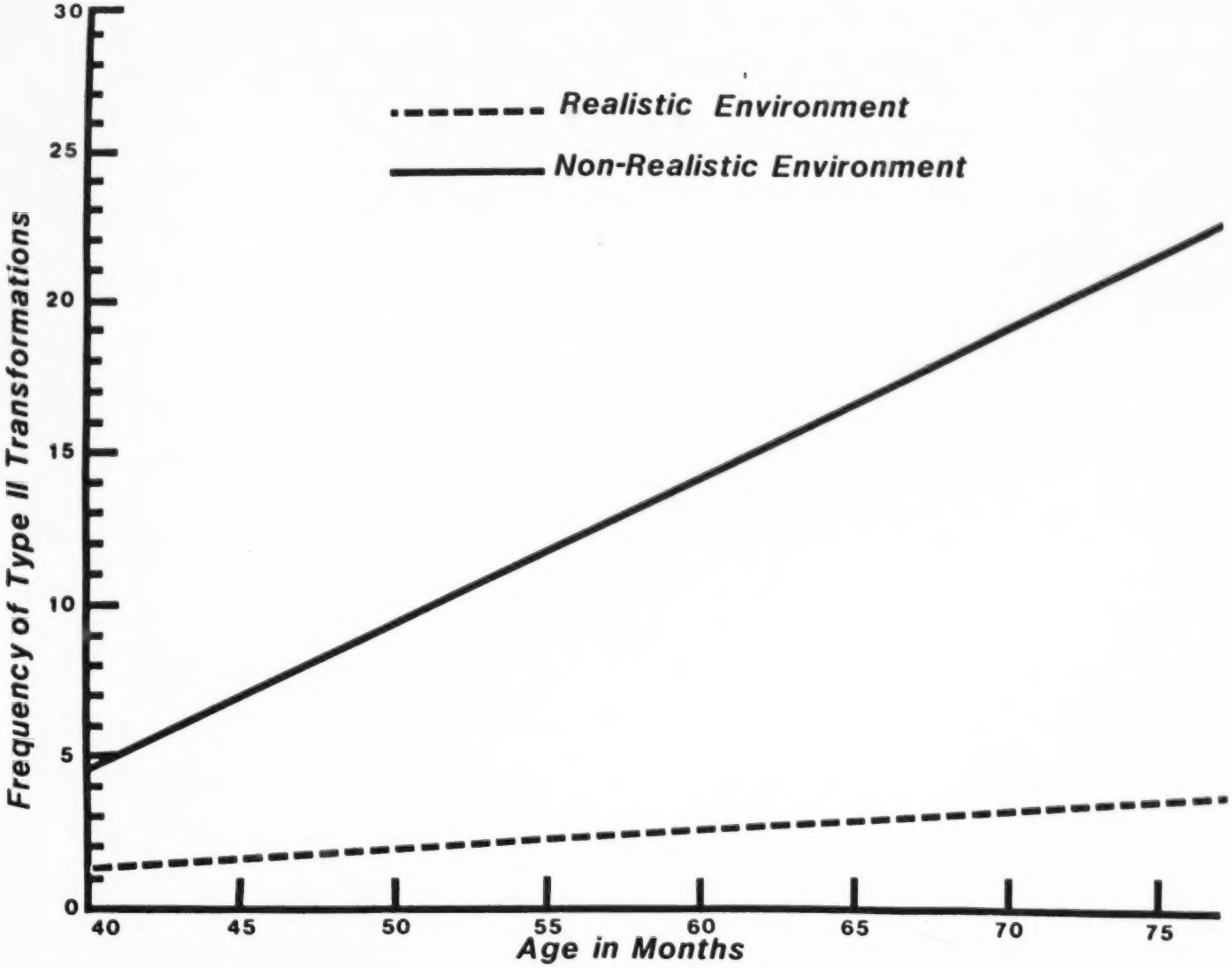

Figure 2.

Regression Lines Illustrating Age x Play Environment Interaction Effects on Type II Transformations.

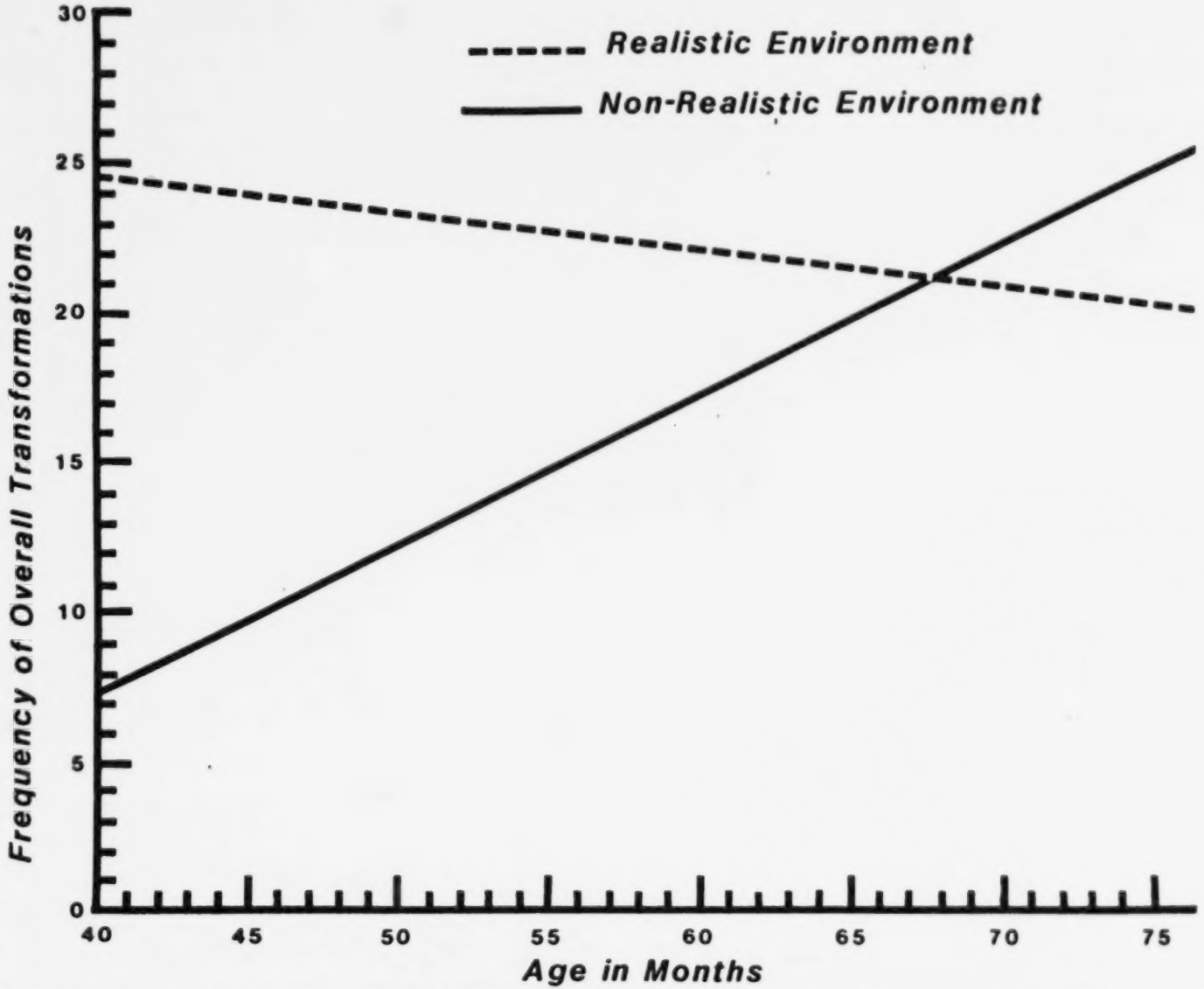

Figure 3 Regression Lines Illustrating Age x Play Environment Interaction Effects on Overall Transformations